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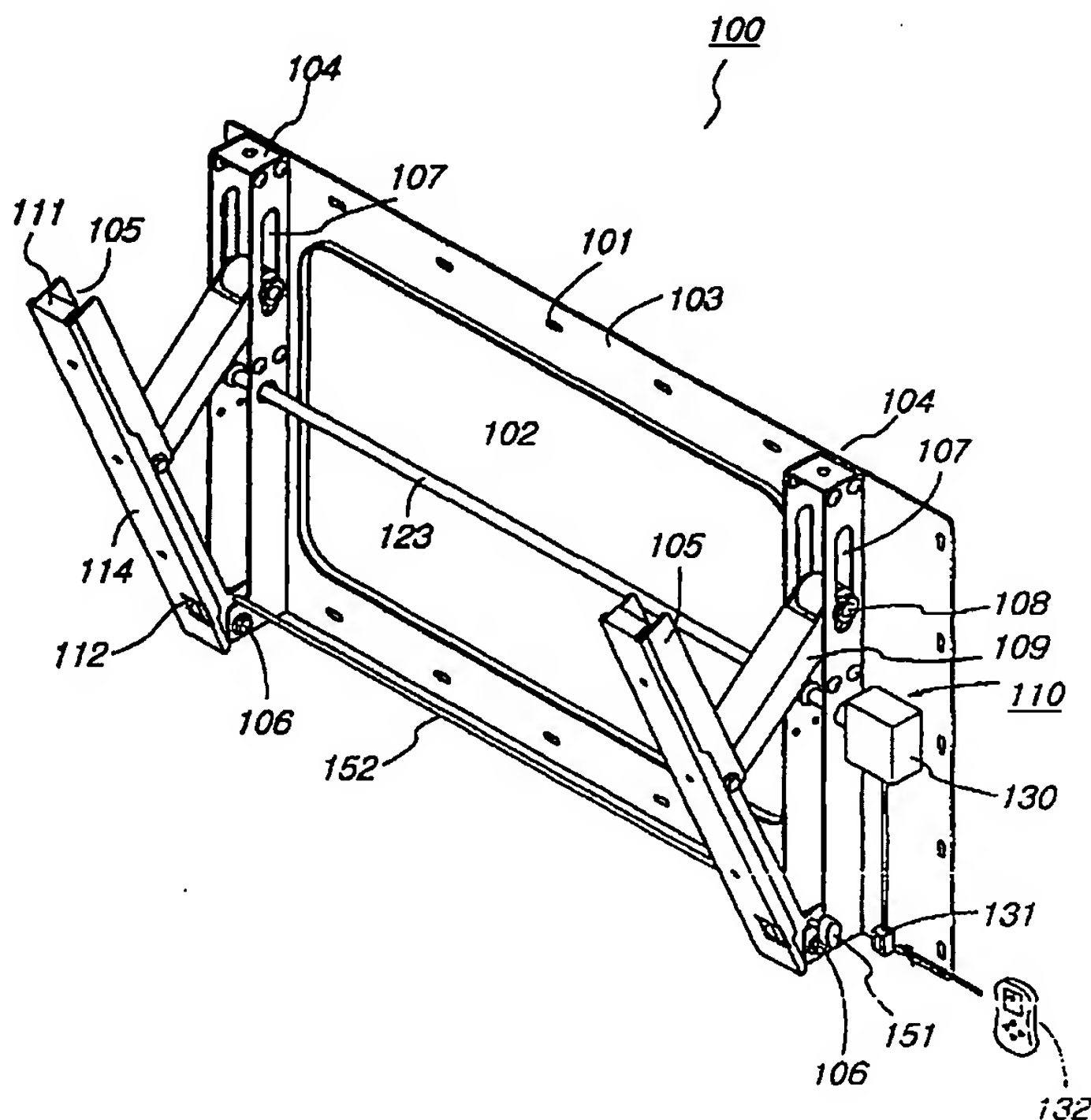
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[Continued on next page]

(54) Title: WALL-MOUNTING DEVICE FOR TELEVISION



(57) Abstract: Disclosed is a wall-mounting device for a television capable of easily controlling its angle without a users movement and providing convenience in use to the user by making coupling and separation between fixing members and mounting members easy. The wall-mounting device includes: a base fixed on a wall; channels fixed at both sides of the base; mounting members hinged at a lower end of the channel; fixing members coupled to the mounting members for fixing the television; restricting brackets located at inner and lower ends of the mounting members, each restricting bracket having a stop hole for restricting a stop pin formed integrally on the fixing member; levers for connecting the channel with a central portion of the mounting member; and angle controlling means provided between the channel and the lever, wherein a motor is mounted and fixed at a side of the control shaft of the angle controlling means and on the base to rotate the control shaft and control an angle, the motor being operated through operation means such as a manipulation switch or a

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remote controller.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Wall-mounting device for television****BACKGROUND OF THE INVENTION****Technical Field**

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The present invention relates to a wall-mounting device for a television, and more particularly, to an improved wall-mounting device capable of fixing a thin television on a wall or a ceiling in an angle-controllable manner.

10 **Background Art**

In general, a television is put on a floor of a room or an office using a supporting stand when being furnished in the house or office because being in the form of a hexahedral case.

15 

Because such box-type television occupies a space to the extent of a size (volume) of the television, it is difficult to utilize the space where the television is located.

However, as the technology in this field has been developed, the box-type television is gradually replaced by a thin television. Since such thin television cannot stand alone, and thereby, a stand or a turntable for the exclusive use of the television is required. Recently, wall-mounting devices for fixing the television on a wall or a ceiling have been developed and used.

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The same inventor of this invention also has filed lots of patent applications relative with such wall-mounting devices, and representative examples of them will be described hereinafter referring to FIGS. 1 to 3.

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The wall-mounting device 50 for the television includes a plurality of fixing holes 51 formed in equal intervals in the wall, and a base 53 having a hollow part 52 for lightweight.

The base 53 has a pair of channels 54 fixed at both sides thereof, mounting

members 55 located at lower end portions of the channels 54 for fixing the television and hinges 56 for coupling the lower end portions of the channels and lower end portions of the mounting members 55.

Each channel 54 has an elongated hole 57 vertically formed in the channel, and a pin 58 and a lever 59 are inserted into the elongated hole 57 and connected between the channel 54 and a central portion of the mounting member 55. The elongated hole 57, the pin 58 and the lever 59 are respectively provided with angle controlling means 60.

The angle controlling means 60 is inserted into the elongated hole 57 of the channel 54 to easily control the angle by improving the angle controlling means 60 and connects screws 61 to the pins 58, to each of which the lever 59 is connected, vertically. Lower ends of the screws 61 can freely rotate on brackets 62 fixed inside the channels 54.

A bevel gear 65 is fixed on the lower end of the screw 61 and engaged with a bevel gear 67 fixed on a control shaft 66, which is mounted in a horizontal direction of the channel 54. The control shaft 66 is provided with a grip 68 at a side thereof to easily rotate the control shaft 66.

The prior art has an advantage that angle control is easy because the angle control means is mounted at a side of the channel. However, if the angle is not appropriate when a user watches television, the user must stand up and go to the wall-mounting device to control the angle.

Especially, when fixing members, to which the television is fixed, are coupled with the mounting members, upper ends of the fixing members are mounted in a state that the upper ends of the fixing members are coupled with upper ends of the mounting members. Stop pins projecting from lower ends of the fixing members are respectively restricted through restricting holes of restricting brackets inside the mounting members.

When the fixing members are coupled with the mounting members, the

restricting bracket are pulled downwardly to allow the stop pin to easily enter the restricting holes. After the coupling, the restricting brackets are released and returned in original position by the spring, and thereby the stop pins are restricted to prevent the separation of the fixing members.

5 Therefore, the prior art has another disadvantage that the user must operate the restricting brackets provided at both sides whenever the fixing members are coupled or separated. Moreover, the prior art has a further disadvantage that it is impossible that the fixing members are easily coupled to or separated from the mounting members by himself/herself because the television is very heavy.

10 Furthermore, when the mounting members are controlled in angle, load of the television is concentrated on the levers connecting the mounting members to the channel. Therefore, the angle is easily controlled by the weight of the television when the mounting members are separated from the channel but it is not easy to control the angle when the mounting members are contacted to the channel.

15

### **Disclosure of Invention**

Therefore, the present invention is directed to a wall-mounting device for a television that substantially obviates one or more problems due to limitations and  
20 disadvantages of the related art.

It is an object of the present invention to provide a wall-mounting device for a television capable of easily controlling its angle without a user's movement by improving a connected part between angle controlling means and levers and a restricting bracket part for restriction of mounting members of the wall-mounting  
25 device for the television.

It is another object of the present invention to provide a wall-mounting device for a television capable of providing convenience in use to the user by making coupling and separation between fixing members and the mounting

members easy.

It is to be understood that both the foregoing general description and the following detailed description of the present invention are exemplary and explanatory and are intended to provide further explanation of the invention as  
5 claimed.

### **Brief Description of the Drawings**

Further objects and advantages of the invention can be more fully  
10 understood from the following detailed description taken in conjunction with the accompanying drawing in which:

FIG. 1 illustrates a perspective view of a conventional wall-mounting device for a television;

FIG. 2 illustrates a perspective view, partly in section, of an A part of the  
15 conventional wall-mounting device for a television of FIG. 1;

FIG. 3 illustrates a partially sectional view, taken in a B direction, of the conventional wall-mounting device for a television of FIG. 2;

FIG. 4 illustrates a perspective view of a wall-mounting device for a television according to a first preferred embodiment of the present invention;

20 FIG. 5 illustrates a sectional view taken in C-C line of the wall-mounting device for the television of FIG. 4;

FIG. 6 illustrates a sectional view, partly in section, of a D part of the wall-mounting device for the television of FIG. 5;

FIG. 7 illustrates a sectional view, partly in section, of a E part of the wall-  
25 mounting device for a television of FIG. 5; and

FIG. 8 illustrates a perspective view of a wall-mounting device for a television according to a second preferred embodiment of the present invention.

### **Best Mode for Carrying Out the Invention**

The present invention will now be described in detail in connection with preferred embodiments with reference to the accompanying drawings. For  
5 reference, like reference characters designate corresponding parts throughout several views.

FIG. 4 illustrates a perspective view of a wall-mounting device for a television according to a first preferred embodiment of the present invention. FIG.  
5 illustrates a sectional view taken in C-C line of the wall-mounting device for the  
10 television of FIG. 4. FIG. 6 illustrates a sectional view, partly in section, of a D part of the wall-mounting device for the television of FIG. 5, and FIG. 7 illustrates a sectional view, partly in section, of an E part of the wall-mounting device for a television of FIG. 5.

The wall-mounting device 100 for the television includes a plurality of  
15 fixing holes 101 formed in equal intervals in the wall, and a base 103 having a hollow part 102 for lightweight.

The base 103 has a pair of channels 54 fixed at both sides of the base 103, mounting members 105 located at lower end portions of the channels 54 and hinges  
106 for coupling the lower end portions of the channels and lower end portions of  
20 the mounting members 105.

Each channel 104 has an elongated hole 107 vertically formed in the channel, and a pin 108 and a lever 109 are inserted into the elongated hole 107 and connected between the channel 104 and a central portion of the mounting member  
105. The elongated hole 107, the pin 108 and the lever 109 are respectively  
25 provided with angle controlling means 110.

Each mounting member 105 has a hook 111 and a stop pin 112 at upper and lower ends of the outside of the mounting member 105 and a fixing member 114 fixed on a rear part of the television 113. A restricting bracket 116, which has a



stop hole 115 to restrict the stop pin 112 of the fixing member 114 and is connected through a spring 117, is provided in the lower portion of each mounting member 105.

5 The angle controlling means 110 is inserted into the elongated hole 107 of the channel 104 and connects a screw 120 to the pin 108, to which the lever 109 is connected, vertically. A lower end of the screw 120 can freely rotate to a bracket 121 fixed inside the channel 104.

A bevel gear 122 is fixed on the lower end of the screw 121 and engaged with a bevel gear 124 fixed on a control shaft 123, which is mounted in a horizontal 10 direction of the channel 104.

In the present invention, by improving the angle controlling means 110 and the restricting brackets 116, the angle for allowing the user to watch the television in an optimum location can be easily controlled and the television can be easily coupled with the wall-mounting device.

15 For this, in case of the angle controlling means 110, the control shaft 123 is connected with a motor 130, which is fixed on the base 103, to rotate the control shaft 123. The motor 130 is operated by operating means, such as a remote controller 132 or a manipulation switch 131, fixed at a lower portion of the base. 103.

20 A torsion spring 140 is interposed in the pin 108 of the lever 109, which connects the channel 104 and the mounting member 105 so that the mounting member 105 is always pulled toward the channel 104, thereby reducing power required when the angle is reduced.

The restricting brackets 116 respectively have operation fragments 150 25 formed integrally at lower portions of the restricting brackets 116 having the stop holes 115 to receive the stop pins 112 formed integrally with the fixing members 114.

The operation fragments 150 are lowered by operation cams 153 fixed at



both ends of a shaft 152, which has a grip 151 and is coupled horizontally at the lower end of the mounting member 105, so that the stop pin 112 can be freely inserted into or separated from the stop hole 115.

Of course, if the operation cams 152 are returned in original position, the restricting brackets 116 are raised by the middle portions of the mounting members 105 and the springs 117 to restrict the inserted stop pins 112.

Like the prior arts, the base 103 is contacted to the wall and firmly fixed through bolts or screws. After that, the fixing members 114, on which the television 113 is fixed, are coupled to the mounting members 105, and thereby the television 113 can be mounted on the wall.

When the user wants to couple the fixing members 114, on which the television is fixed, with the mounting members 105, the hooks 111 formed at the upper ends of the fixing members 114 are caught to the upper ends of the mounting members 105.

In this condition, when the user holds the grip 151 and rotates the shaft 152, the operation cams 153 are operated and push the operation fragment 150 of the restricting brackets 116 located inside the lower ends of the fixing members 105, and thereby the restricting brackets 116 are lowered.

When the restricting brackets 116 are lowered, the springs 117 are expanded and the stop holes 115 of the restricting brackets 116 and the stop pins 112 of the fixing members 114 are fit to each other. Therefore, when the user releases the fixing members 114, the stop pins 112 are naturally inserted into the stop holes 115. When the user rotates the grip 151 to return the operation cams 153 in the original position after the insertion of the stop pins 112 are finished, the restricting brackets 116 are raised by restoring force of the expanded springs 117 and then located in the initial position. The stop holes 115 restrict the stop pins 112, and thereby the fixing members 114 can be completely restricted.

After the coupling of the television is finished, the angle of the television is

controlled in consideration of the user's eyes to keep the optimum angle for watching the television.

The angle for watching the television can be controlled by changing a contact level and an interval between the mounting members 105 and the channel 104, by operating the motor 130, which is provided at a side of the control shaft 123 horizontally mounted at the central portion of the channel 104, in a state that the television 113 is fixed and rotating the control shaft 123 forwardly or backwardly.

Because the bevel gear 124 fixed on the control shaft 123 and the bevel gear 122 fixed at the lower end of the screw 120 are engaged with each other by rotating the control shaft 123, the screw 120 is rotated in the same direction as the control shaft 123.

When the screws 120 are rotated, the pins 58, which are coupled with the screws 120 and inserted into the operation holes 107 of the channel 104, are moved in upper and lower directions of the channel 54.

The levers 109 connected with the pins 108 are moved by the movement of the pins 58, and then, the mounting members 105 are contacted to or become more distant from the channel 104, thereby controlling the angle of the television 113 fixed on the mounting members 105.

That is, when the pins 108 are raised by the rotation of the control shaft 123 and the screws 120, also the levers 109 connected to the pins 108 are raised, and thereby the mounting members 105 are contacted toward the channel 104. When the pins 108 are lowered, also the levers 109 connected to the pins 108 are lowered, the mounting members 105 become more distant from the channel 104. Through the above way, the angle of the television can be controlled.

Especially, when the channel 104 and the mounting members 105 are controlled in angle, the mounting members 105 are always pulled toward the channel 104 by the torsion spring 140 interposed between the lever 109 and the

mounting member 105. Therefore, if the user wants to make the angle large, the angle can be easily controlled by the weight of the television 113, and if the user wants to make the angle small, the angle can be easily controlled by the torsion spring 140.

5        According to the present invention, the motor 130 connected to the control shaft 123 can be easily controlled using the manipulation switch 131 or the remote controller 132 at a long distance without the user's movement. Therefore, the present invention can provide convenience in use.

FIG. 8 illustrates a perspective view of a wall-mounting device for the  
10    television according to a second preferred embodiment of the present invention. The wall-mounting device according to the present invention can obtain the same effects even though utilized to television holding means 200 fastened on the ceiling.

In this case, the present invention further includes a vertical strut 240 to fasten the television holding means 200 on the ceiling and a bracket 230 coupled  
15    with the base 103. The bracket 230 has a motor 220 inside. The base 103 can be rotated on the vertical strut 240 to control the direction of the television.

While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art  
20    can change or modify the embodiments without departing from the scope and spirit of the present invention.

**What Is Claimed Is:**

1. A wall-mounting device for a television comprising:  
a base fixed on a wall;  
5 channels fixed at both sides of the base;  
mounting members hinged at lower ends of the channels;  
fixing members coupled to the mounting members for fixing the television;  
restricting brackets located at inner and lower ends of the mounting  
members, each restricting bracket having a stop hole for restricting a stop pin  
10 formed integrally on the fixing member;  
levers for connecting the channel with a central portion of the mounting  
member; and  
angle controlling means provided between the channel and the lever,  
wherein a motor is mounted and fixed at a side of the control shaft of the  
15 angle controlling means and on the base to rotate the control shaft and control an  
angle, the motor being operated through operation means such as a manipulation  
switch or a remote controller.

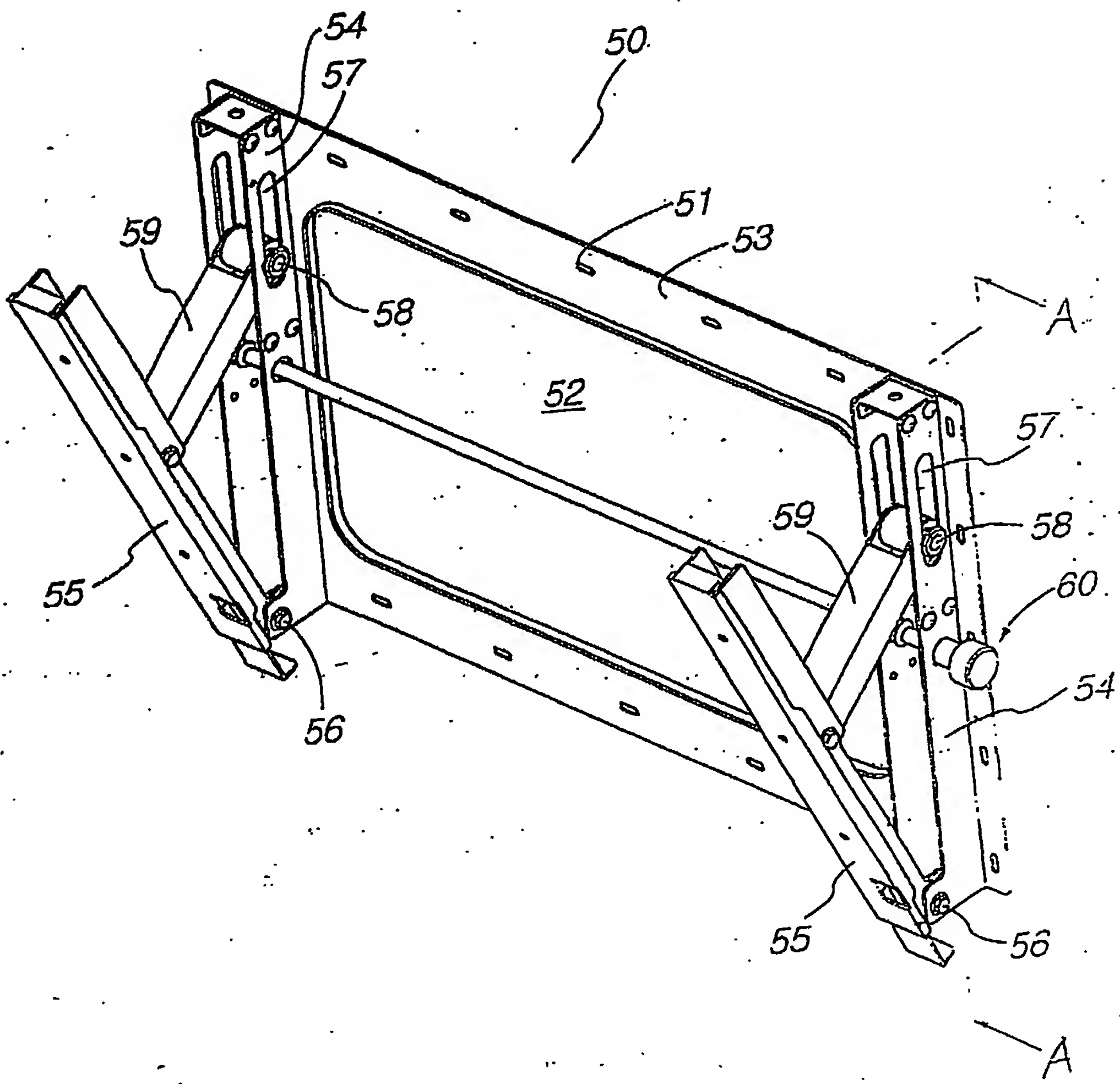
2. The wall-mounting device according to claim 1, wherein a torsion  
20 spring is interposed in a pin of the lever, which connects the channel and the  
mounting member, to always pull the mounting member toward the channel.

3. The wall-mounting device according to claim 1, wherein the restricting  
bracket located at the inner and lower end of the mounting member has an  
25 operation fragment formed integrally at a lower portion of the restricting bracket;  
and

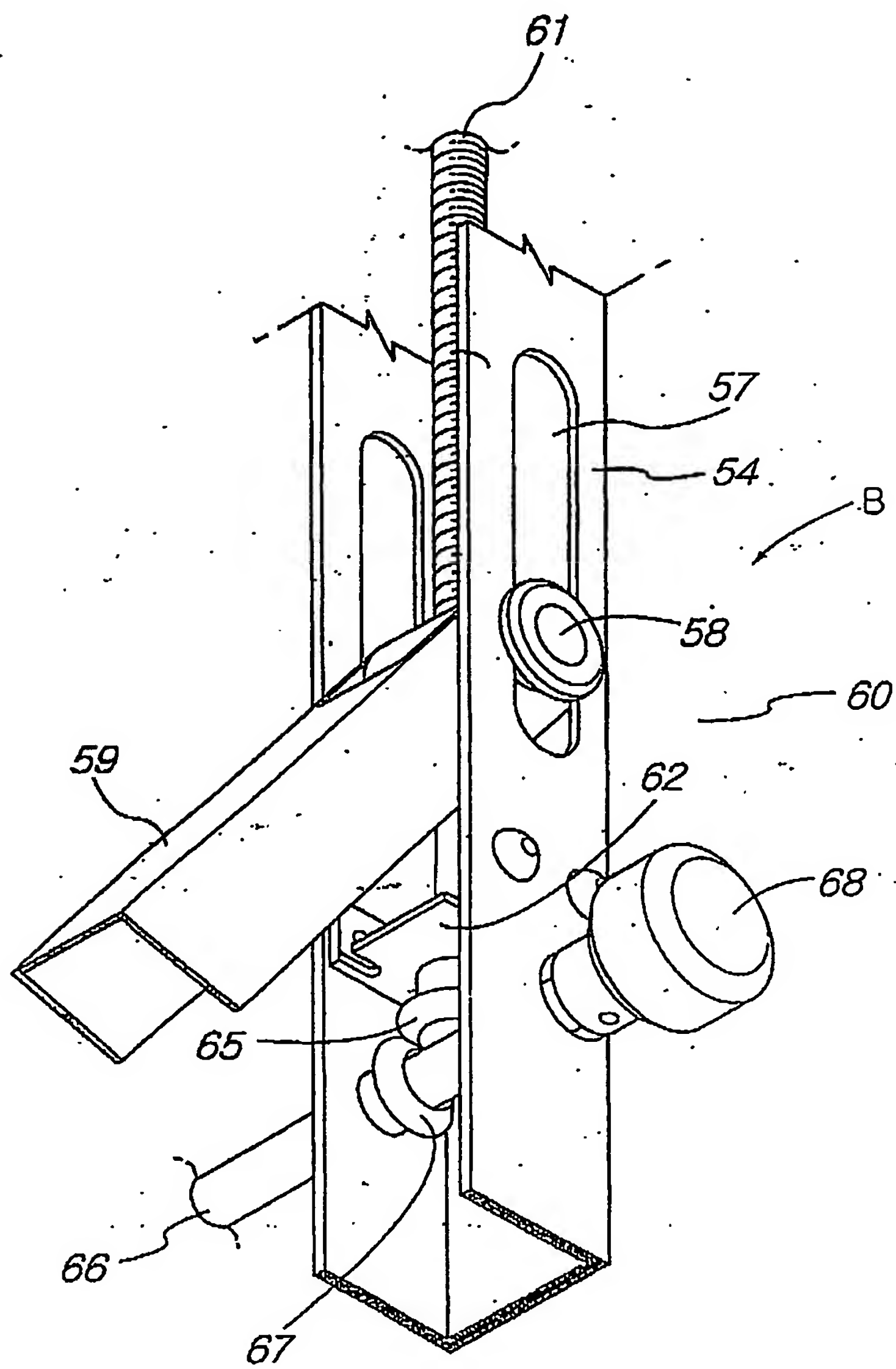
Wherein the operation fragment has a grip at a side of a lower end of the  
mounting member and is lowered by an operation cam fixed at both ends of a shaft

horizontally connected, so that the stop pin is freely inserted into or separated from the stop hole.

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FIG.1

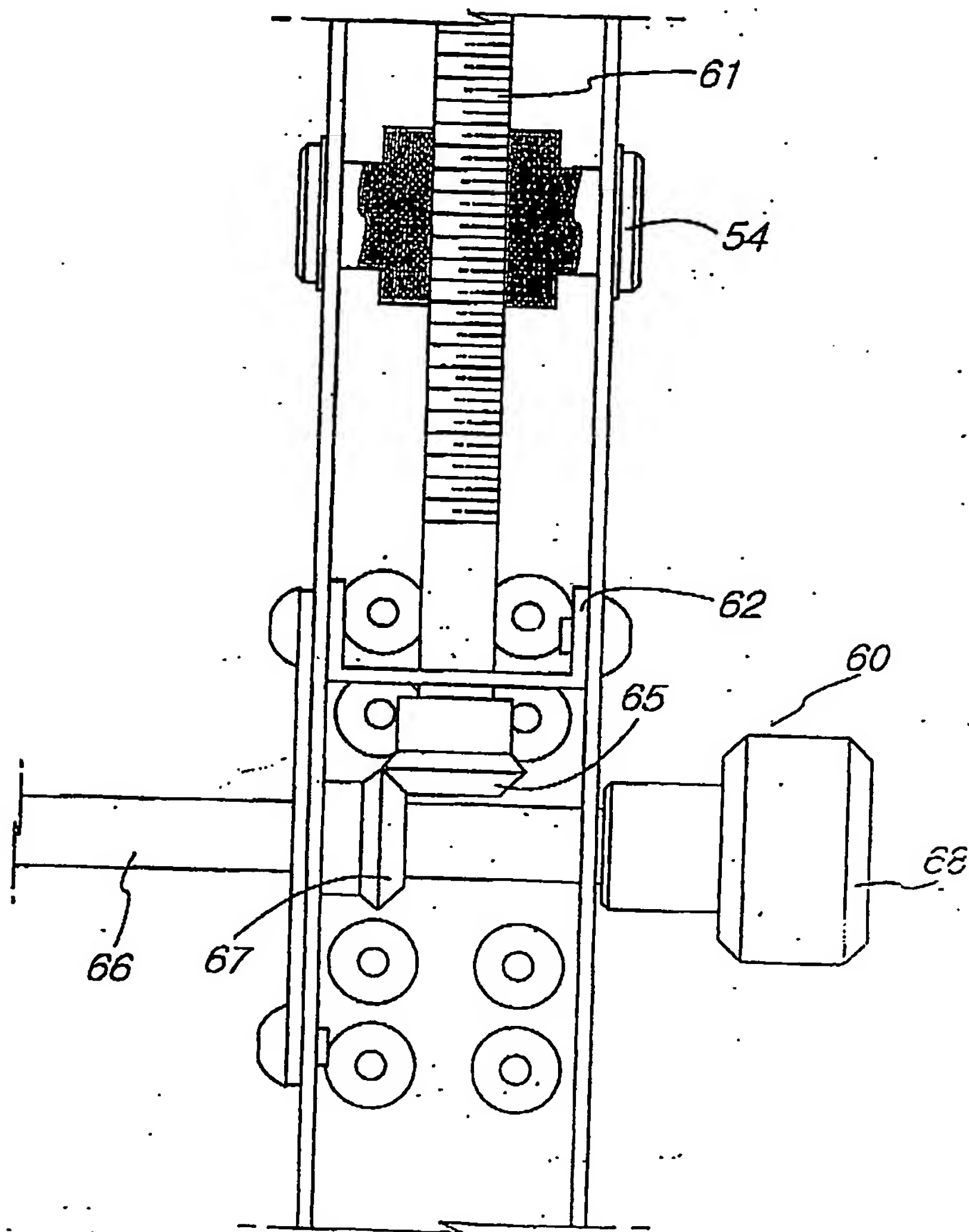


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FIG.2

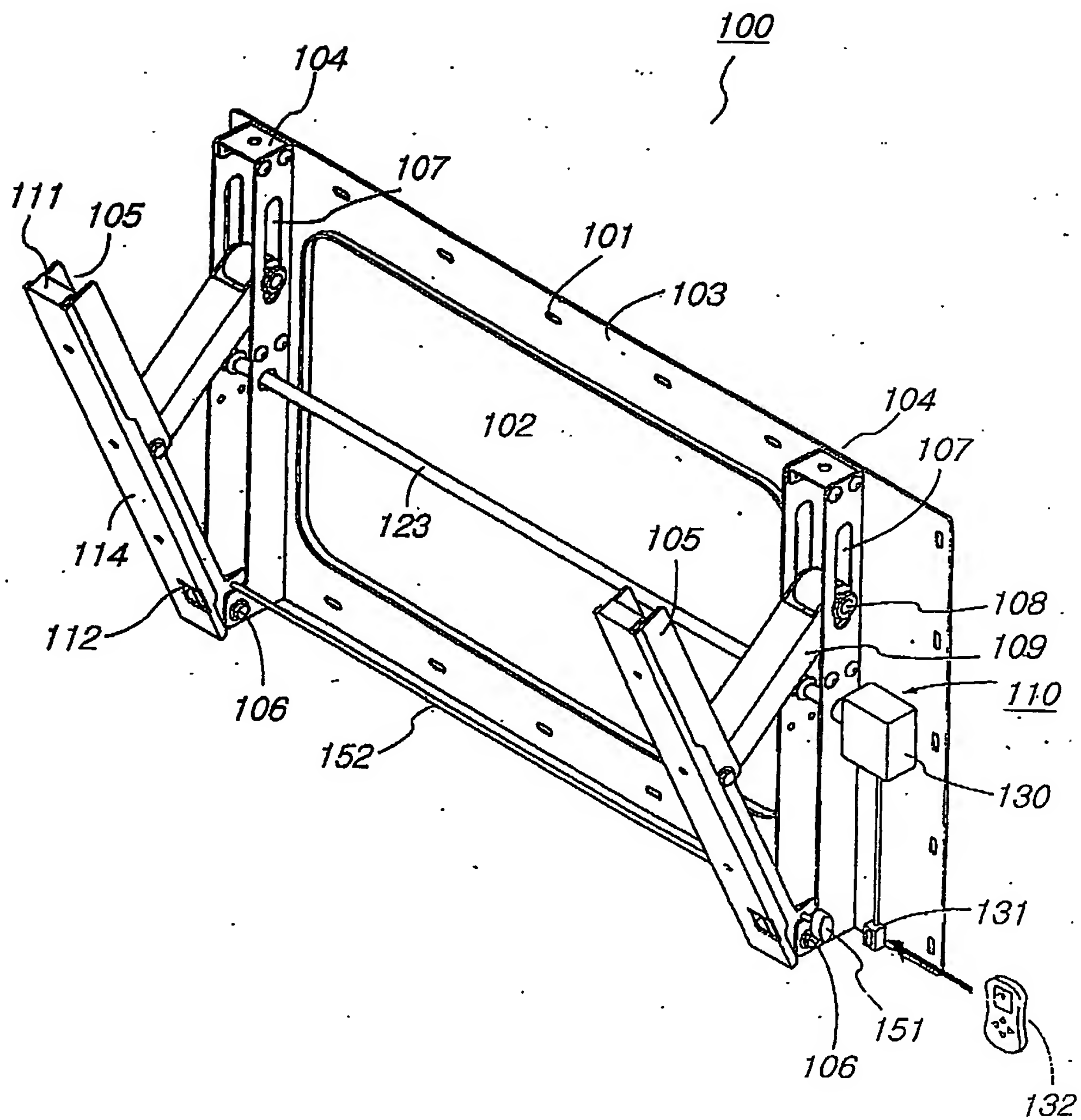




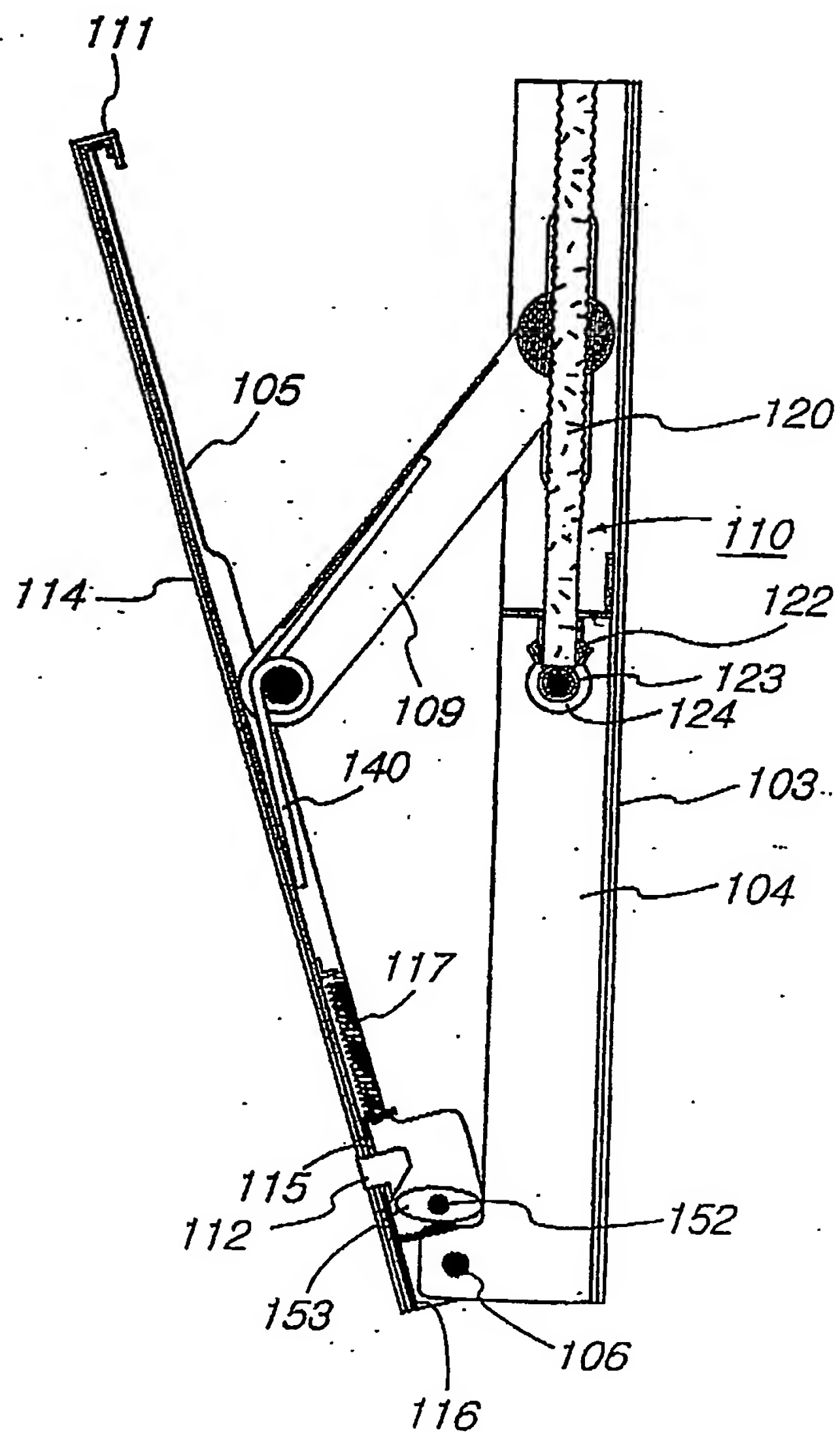
3/8  
FIG.3



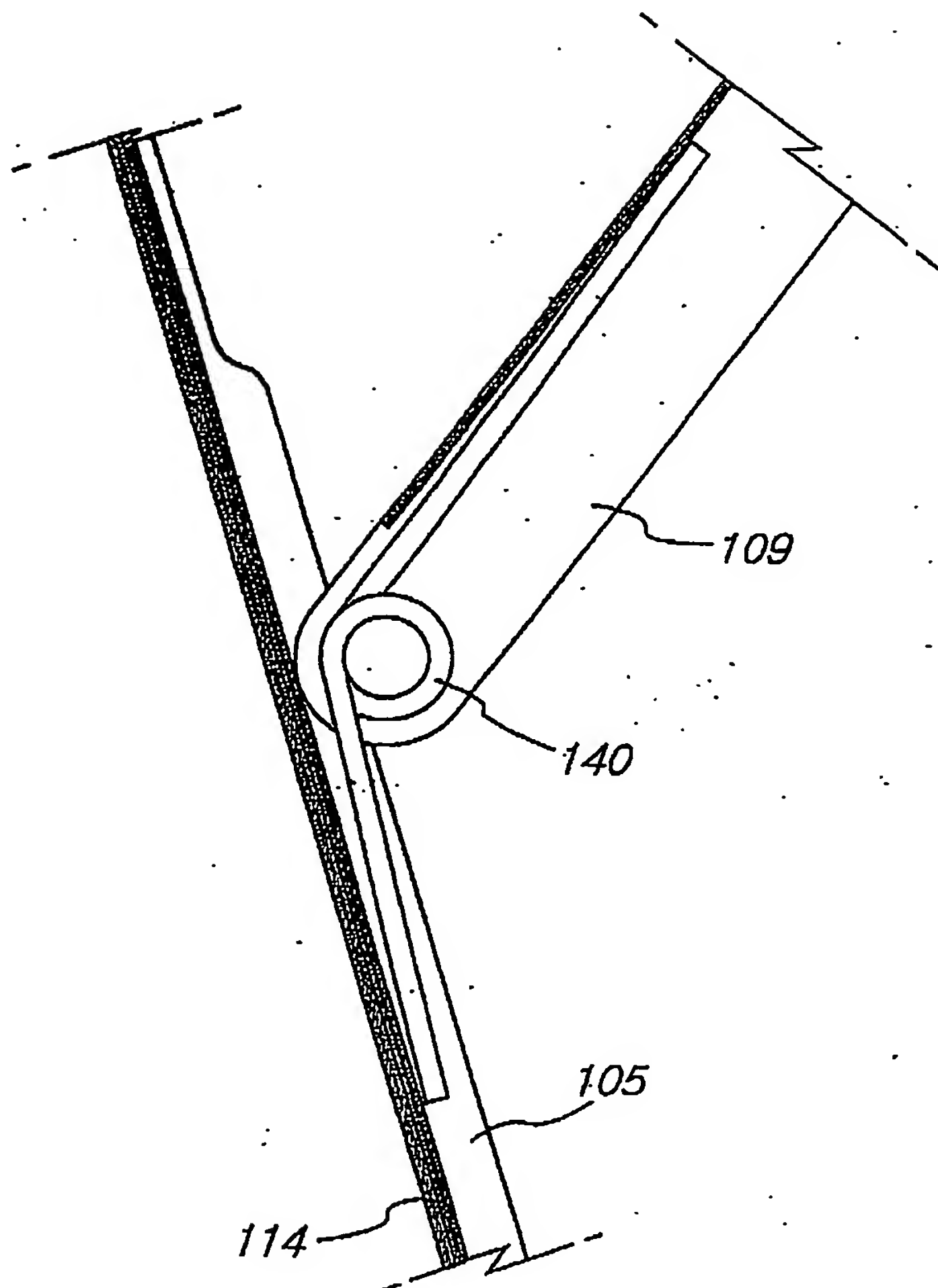
4/8  
FIG.4



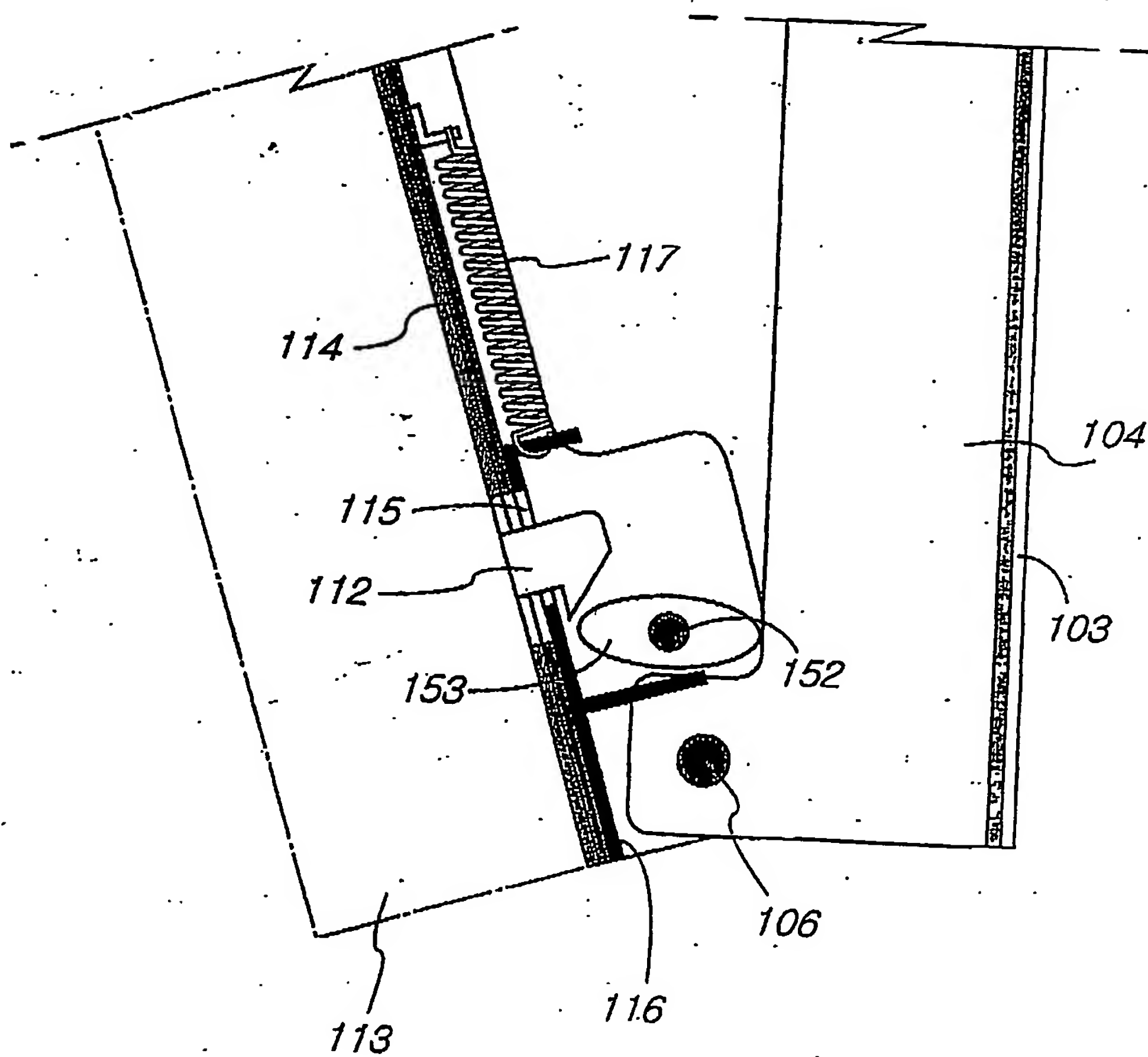
5/8  
FIG.5



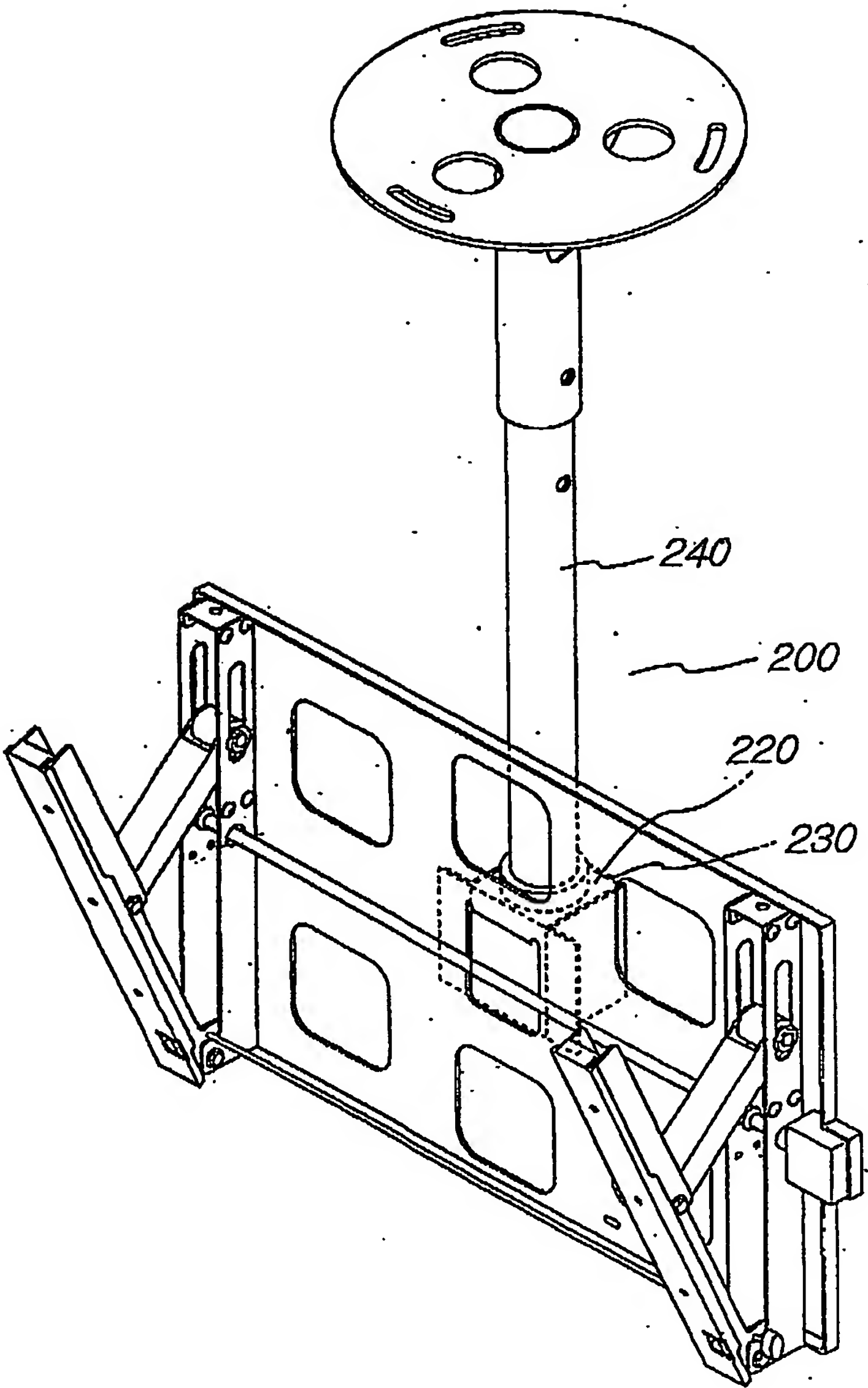
6/8  
FIG.6



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FIG.7



8/8  
FIG.8



# INTERNATIONAL SEARCH REPORT

International application No.

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04N 5/655

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 H04N 5/655

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patent and applications for inventions since 1975

Utility models and applications for utility Models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

NPS : "wall, mount, PDP, television, display, lever"

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	KR 248,227 Y (SEA JUNG MIL. CO. LTD.) 29.OCTOBER.2001 * the whole document *	1, 2
A	KR 2000-0011034 Y (DAEWOO.ELECTRONICS CO.) 26.JUNE.2000 * the whole document *	1, 2
A	JP 07-212681 A (FUJITSU GENERAL LTD) 11.AUGUST.1995. * the whole document *	1, 2

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

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Date of the actual completion of the international search

24 JUNE 2002 (24.06.2002)

Date of mailing of the international search report

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

PCT/KR01/01967

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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KR 2000-0011034 Y	26.JUNE.2000	NONE	
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